



Women's Smoking History Prior to Entering the US Navy: A Prospective Predictor of Performance



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RESEARCH PAPER

Women's smoking history prior to entering the US Navy: a prospective predictor of performance

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Objective: To examine whether women's tobacco use prior to entering the US Navy is predictive of subsequent career performance. A priori predictions were that smoking at entry into the Navy would be related to early attrition, poorer job performance, more disciplinary problems and lower likelihood of re-enlistment.

Methods: A prospective cohort analysis of 5487 women entering the US Navy between March 1996 and March 1997 was conducted. Navy attrition/retention and career performance measures, such as time in service, early attrition, type of discharge, misconduct, number of promotions, demotions and unauthorised absences, highest paygrade achieved, and re-enlistment were examined.

Results: Compared with never smokers, daily smokers at entry into the US Navy had subsequent career outcomes consistently indicating poorer job performance (eg, early attrition prior to serving a full-term enlistment, more likely to have a less-than-honourable discharge, more demotions and desertions, lower achieved paygrade and less likely to re-enlist). Other types of smokers consistently fell between never and daily smokers on career outcome measures.

Conclusions: For women entering the US Navy, being a daily smoker is a prospective predictor of poorer performance in the Navy. Future research should evaluate the effectiveness of cessation intervention with smoker-enlistees prior to their entering the Navy, to assess the impact on subsequent career outcomes.

More than 435 000 Americans die each year as a result of cigarette smoking. One in every five American deaths are cigarette related, including 30% of all cancer deaths (87% of lung cancer deaths), 21% of coronary heart disease deaths, 18% of stroke deaths and 82% of chronic obstructive pulmonary disease deaths.^{1–2} Use of other forms of tobacco (eg, cigars, pipes, snuff or dip) is also associated with significantly elevated morbidity and mortality,³ as is chronic exposure to secondhand smoke.^{4–6} Smoking also imposes a considerable financial burden on society, with treatment of smoking-related diseases costing US\$50–73 billion/year⁷ and US\$584 million in the US Department of Defense.⁸ In both the civilian and military sectors, smoking has been linked to disability and job-related outcomes, including decreased productivity, increased absenteeism, and long and more frequent work breaks.^{8–9}

Tobacco use is of particular concern to the US Department of Defense because, historically, the military has had higher and heavier rates of tobacco use than civilians.^{10–12} Although smoking in the military decreased dramatically from 1980 to the mid-1990s,¹³ there was a significant increase from 1998 to 2002, marking the first increase in two decades.¹⁰ Past-month cigarette smoking continues to exceed "Healthy People 2010" objectives of 12%, with 33.8% of military personnel smoking in the past month in 2002.¹⁰

Previous research indicates that cigarette smoking in the military has adverse effects on personnel health, performance, physical fitness and attrition.^{14–16} Numerous studies have concluded that there are negative relationships between smoking and success in combat training among military personnel.^{17–18} Smokers tend to exercise less and perform more poorly on military physical fitness tests.^{14–20} In addition, studies show high rates of smoking persist even after discharge from military service.^{21–22} A recent concern among military health officials is the skyrocketing smoking rates among soldiers in Iraq, the post-deployment implications of which are not yet known.

Another adverse effect of smoking that has recently gained attention is early attrition from military service. First-term attrition is one of the most serious and costly personnel problems faced by the US military.²³ A study of a large number of US Air Force recruits conducted by Klesges and colleagues¹⁵ found smoking to be the best single predictor of early discharge over a 12-month period, with smoking associated with US\$130 million/year in excess training costs extrapolated across all the military services. The study sample of Klesges *et al*¹⁵ was predominantly men and did not report the effects of smoking separately for men and women, so it might be questioned whether the smoking and early attrition effects would hold for women as well as men.

This study examined an all-female cohort of women entering the US Navy between March 1996 and March 1997. Self-reported cigarette smoking just prior to entering the Navy was examined as a prospective predictor of performance in the Navy over a possible 7–8 year follow-up period. Groups based on self-reported smoking history as "daily smokers," non-daily "other smokers" and "never smokers" at entry into the Navy were examined to prospectively assess the relationship between smoking history reported just prior to entering the Navy and subsequent career performance.

METHODS

Procedures

Two existing data sets were combined to conduct this study. The first data set was developed for a study funded by the Defense Women's Health Research Program administered by the US Army Medical Research and Materiel Command (Grant #DAMD17-95-1-5075, "Improving Navy women's health: preventing smoking relapse after recruit training"). In that study called "Operation Stay Quit" (OSQ), 5503 women

Abbreviations: CHAMPS, Career History Archival Medical and Personnel System; OSQ, Operation Stay Quit; RTC, Recruit Training Command

Table 1 Comparison of smoking groups based on attrition/retention-related outcomes

Attrition/retention variable	Mean (SD) or %			F or χ^2	
	Never smoker	Other smoker	Daily smoker	Bivariate	Multivariate
Time in service (years)‡	3.61 (1.80)	3.42 (1.88)	2.97 (1.98)	54.29***	35.5***
Attrition categories (%)‡				129.81***	86.3***
Completed term	62.8	57.7	45.5		
Attrited after 1 year	24.9	26.8	31.2		
Attrited prior to 1 year	7.3	9.3	13.8		
Attrited in recruit training	5	6.3	9.5		
Less-than-honourable /general discharge (%)‡	2.8	4.3	6.5	31.08***	22.6***
Reasons for discharge (%)				157.71***	94.7***
Officer commission§	1.1	0.6	0.2		
Completion of service‡	48	43.5	39		
Convenience of government‡	30.8	30.4	24.8		
Medical§	5.8	7.5	7.6		
Behavioural disorder‡	2.1	2.4	4.1		
Personality disorder§	8.2	11.7	18.7		
Sexual disorder§	0.5	1.3	1.3		
Punitive‡‡	3.3	2.4	4.2		
Discharges due to misconduct (%)‡	6.8	8.4	15.6	82.86***	66.3***
Discharges due to drug misuse (%)‡	1.4	3.5	7.3	92.31***	73.9***
Discharges due to pregnancy (%)	3.9	5.3	5.2	NS	NS
Severity-of-loss score*	347.2 (177.7)	363.7 (185.2)	413.6 (209.4)	56.90***	40.2***

NS, not significant.

*** $p \leq 0.001$.†F is from general linear model analysis of variance for continuous outcomes; χ^2 is for likelihood ratio test from multinomial logistic regression for categorical outcomes or χ^2 is for test of the model coefficient from logistic regression for dichotomous outcomes. All models control for four significant covariates: education, race/ethnicity, term of enlistment and reserve/regular status.

‡Daily smokers significantly different from never smokers.

§Never smokers significantly different from other two categories.

*All groups are significantly different.

‡‡Daily smokers significantly different from other smokers.

Number of participants summarised for this table ranged from 5281 to 5438.

recruits entering the US Navy between March 1996 and March 1997, provided detailed information on their smoking history just prior to entering the Navy. During their first week of processing at Recruit Training Command (RTC), Great Lakes, Illinois, USA, recruits completed a baseline smoking survey as part of a larger longitudinal field intervention trial aimed at helping women recruits refrain from cigarette smoking after leaving the smoke-free environment at RTC.²⁴

The second data set consisted of personnel and medical data gathered from the Career History Archival Medical and Personnel System (CHAMPS), a database maintained by the Naval Health Research Center, San Diego, California, USA. By matching existing OSQ data (using social security numbers) on 5503 women recruits with their subsequent career performance and hospitalisation data from the CHAMPS database, it was possible to investigate whether women's smoking history prior to entering the Navy was a prospective predictor of career outcomes and hospitalisations after 7–8 years of service in the Navy.

All procedures used in this research were approved by the Institutional Review Boards, at both San Diego State University and Naval Health Research Center, San Diego, California.

Smoking survey measures

The smoking survey was a self-administered, optically scannable questionnaire that assessed the smoking status of female Navy recruits, and their smoking and quitting history "prior to recruit training" (ie, prior to entering the Navy). Self-report smoking measures were based on those used by other researchers investigating smoking and cessation among Navy and young civilian populations.^{25–27} The primary smoking variable for this investigation was a three-category measure based on two separate items asking individuals to (a) report on the frequency of smoking (ie, not applicable/don't smoke, every

day or some days) and (b) their perceptions of the type of smoker they are (ie, never smoker, experimented, occasional, daily or former). On the basis of our previous research, an individual's self-reported smoking status may vary depending on the wording of the item. Therefore, we used these two items (one behavioural and one based on perceptions) to derive the smoking status. The three categories derived were: (a) never smoker (b) other smoker and (c) daily smoker. Never and daily smokers were individuals who consistently reported their status on both items as either never smoking or daily smoking. Individuals reporting they were experimenters, occasional smokers, some-days smokers or former smokers, and the relatively few ($n = 86$) who were inconsistent on the two items were categorised as other smokers. The rationale for the inclusion of former and experimental smokers as other smokers was based on previous studies of Navy personnel that suggested these individuals may be at risk for smoking regularly once joining the Navy.²⁸

CHAMPS demographic, attrition, performance and hospitalisation variables

The CHAMPS database contains information on all enlisted members on active duty in the US Navy since 1973 (Gunderson *et al*²⁹ give a detailed description of CHAMPS). The database is a combination of personnel records from the Bureau of Naval Personnel and medical data from the Naval Medical Information Management Center that includes inpatient hospitalisations and death records. The CHAMPS database organises personnel and health data entries, or events, in chronological order by type of event (eg, personnel, medical, discharge) and date. Thus, the database tracks all members from the date of accession to the date of separation or discharge from active duty.

Table 2 Comparison of smoking groups based on career performance outcomes

Performance variable	Mean (SD) or %			F or χ^2	
	Never smoker	Other smoker	Daily smoker	Bivariate	Multivariate
Number of promotions†	2.31 (1.325)	2.22 (1.340)	1.98 (1.417)	27.05***	NS
Number of demotions†	0.070 (0.273)	0.080 (0.285)	0.110 (0.333)	7.56***	4.9**
Number of unauthorised absences	0.020 (0.183)	0.020 (0.151)	0.030 (0.245)	NS	NS
Number of desertions§	0.010 (0.118)	0.020 (0.144)	0.020 (0.172)	4.52**	6.1**
Re-enlisted (%)§	33	26	21	65.23***	9.6**
Highest paygrade achieved*††	4.05 (1.05)	3.95 (1.10)	3.69 (1.18)	44.98***	6.8***
Ever on sea duty (%)†	49	43	42	25.0***	NS
Officer accession (%)	0.9	0.9	0.4	NS	NS

NS, not significant.

** $p \leq 0.01$; *** $p \leq 0.001$.

†Daily smokers significantly differed from other two categories.

‡F is from general linear model analysis of variance for continuous outcomes; χ^2 is for test of the model coefficient from logistic regression for dichotomous outcomes. All models control for five covariates: education, race/ethnicity, term of enlistment, reserve/regular status and time in service (because career outcomes are time dependent).

§Daily smokers significantly different from never smokers.

*All groups are significantly different.

††A paygrade value of 4 is equivalent to a 3rd Class Petty Officer.

Number of participants summarised for this table ranged from 4860 to 5448.

The CHAMPS extract for this study was conducted during June 2005. All but 16 OSQ recruits were successfully matched to CHAMPS. Demographic information, accession variables, attrition-related outcomes, performance data and inpatient hospitalisation information were extracted.

Demographic and accession variables included age computed from birth date to the date of the smoking survey, years of education on entry into the Navy and racial/ethnic group; variables related to accession included length of enlistment obligation measured as a 4- or 8-year term, and regular versus reserve enlistment status.

Attrition-related variables included time in service computed from accession and discharge dates; type of attrition (ie, completed obligated term, attrited after 1 year but before the end of one's obligated service, attrited before completing 1 year and attrited during boot camp training at RTC) computed from accession and discharge dates; percent with less-than-honourable/general discharge; reason for discharge using loss-code groupings developed by the Naval Health Research Center; percent of discharges owing to other groupings of interest, such as misconduct discharges that include those related to drug misuse (discharge codes 601–703, 811–904), drug misuse examined separately (discharge codes 701 and 703), and pregnancy (discharge code 340); and a severity-of-loss score, which is a measure of the severity of the reason for discharge, with scores ranging from 1 to 905. All discharge-related variables were based on the first discharge event because of the relatively small number of women with multiple discharge events.

Career performance-related measures were summary measures already calculated and existing in the CHAMPS database. These included the total number of promotions, demotions, unauthorised absences and desertions the service member received during her enlistment; whether or not the service member re-enlisted subsequent to her first enlistment; the highest paygrade achieved during her career, with values ranging from 1 (Seaman Recruit) to 9 (Master Chief Petty Officer); whether the service member had ever been assigned to sea duty; and whether or not the service member had become an officer sometime during her career.

Description of the sample

The sample was 5503 enlisted female personnel entering the Navy between March 1996 and March 1997. The sample included 93% of the population of all female recruits entering

the US navy during this time period. The 7% not participating (ie, not completing the smoking survey) was primarily because of scheduling conflicts, and introduced no sampling bias. The race/ethnicity distribution of participants was 58% white non-Hispanic, 23% African-American non-Hispanic, 12% Hispanic, 4% Asian/Pacific Islander and 2.4% Native American. The mean (SD) age at entry to RTC was 19.7 (2.75) years, with 75% being aged ≤ 20 years. Most of the recruits had a high school diploma (90%) and 10% had less than a high school education. This was the first enlistment for all but eight women. At the time of their accession, over 99% were single with no dependents, 80% had entered the Navy under the Delayed Entry Program. The breakdown of the sample by smoking category (description given in Smoking survey measures section) was 45% never smokers, 28% other smokers and 27% daily smokers at entry into the Navy.

Analysis

All statistical analyses were conducted using SPSS V.13.0 for Windows, Release 13.0.1. Simple bivariate analyses (ie, χ^2

Table 3 Comparison of smoking groups based on demographic and accession variables

Demographic/accession variable	Mean (SD/SE) or %			F or χ^2
	Never smoker	Other smoker	Daily smoker	
Age (years)	19.8 (2.8)	19.8 (2.8)	19.7 (2.5)	NS
Years of education†	12.2 (0.98)	12.1 (0.90)	11.9 (0.90)	28.90***
Racial/ethnic group (%)‡				
White non-Hispanic	41	63	80	
Black	39	16	6	
Hispanic	13	15	8	
Asian/Pacific Islander	5	4	3	
American Indian	2	2	3	752.30***
Term of enlistment (%)‡				
4 years	86	88	90	
8 years	14	12	10	11.20**
Reservists (%) vs regular enlistment (%)‡	17 vs 83	15 vs 85	12 vs 88	20.36***

NS, not significant.

** $p \leq 0.01$; *** $p \leq 0.001$.

†Daily smokers significantly different from other two categories.

‡Daily smokers significantly different from never smokers.

Number of participants summarised for this table ranged from 5199 to 5481 due to small amounts of missing data in CHAMPS.

analysis for categorical outcomes and one-way analysis of variance for continuous level outcomes) were conducted to describe the relationships among the different smoking groups and the demographic/personnel measures from CHAMPS. If the association from a χ^2 analysis was significant at the 0.05 level, the cell-by-cell adjusted residuals were used to determine which of the three groups differed from one another.³⁰ Similarly, Bonferroni post hoc tests were used for analyses with continuous outcomes to determine which groups differed at the bivariate level.

Because the bivariate associations between smoking groups and prospective attrition/retention outcomes (table 1), and career performance outcomes (table 2) could be confounded by demographic/accession factors existing before entering the Navy, all significant bivariate results were confirmed using multivariate statistical procedures to assess the independent relationship between smoking groups and each outcome after adjusting for significant demographic/accession covariates. Depending on the type of outcome measure, one of the following multivariate procedures was conducted for each attrition/career performance outcome variable: (a) general linear model analysis of variance for continuous outcome variables, (b) binary logistic regression for dichotomous outcomes or (c) multinomial logistic regression for categorical (non-ordinal) outcomes.³¹ In each multivariate analysis, the four demographic/accession covariates significantly related to smoking groups (table 3) were controlled: years of education, race/ethnicity, term of enlistment and reserve versus regular enlistment status. In addition, for the time-dependent career performance outcomes (table 2), time in service (total number of months) also was controlled as a covariate because increases in time-dependent outcomes (eg, promotions and increases in paygrade) can occur simply by virtue of remaining in the service longer. For the logistic and multinomial regression analyses, the never smokers group was used as the reference category.

RESULTS

Bivariate analysis

Table 3 presents the results of bivariate analysis evaluating the association of smoking category with demographic characteristics and accession-related variables. Smoking groups did not differ with regard to age at entry into the Navy, but daily smokers did have slightly less education than the other two groups. Race/ethnic background was a strong correlate of smoking at entry to RTC. Adjusted residuals indicated that differences were primarily between never and daily smokers. Daily smokers were predominately white non-Hispanic (80%), whereas other smokers and particularly never smokers, showed greater variability in their racial/ethnic composition. For example, never smokers were comprised of about equal proportions of whites and blacks (39% and 41%, respectively). Never smokers also typically had a significantly longer term-of-enlistment commitment and a different type of enlistment compared to daily smokers. That is, compared to daily smokers, never smokers were more likely to have an 8-year enlistment term and be reservists or a regular/reserve combination (versus regular enlistment).

Table 1 presents attrition/retention variables by smoking groups. All smoking groups differed significantly in average time in service, with never smokers having the longest time in service, daily smokers having the shortest and other smokers being intermediate. Never smokers were significantly more likely than daily smokers to complete their obligated term and less likely to attrite early (ie, during RTC, before 1 year of service or after 1 year but before the end of obligated service). Other smokers were intermediate between never and daily smokers, but did not differ significantly from those two groups.

Never smokers had significantly fewer less-than-honourable discharges than daily smokers. Other smokers were intermediate, but not significantly different from the other two groups. Smoking groups differed significantly in their reasons for discharge (because discharges due to retirement and death were rare, these two reasons were not included in the overall χ^2 test of associations between discharge reasons and smoking category). Standardised residuals indicated that for most reasons, the discrepancies between the two groups, never and daily smokers were primarily the differences that accounted for the significant finding. Never smokers were more likely than daily smokers to be discharged for getting an officer commission, completion of obligated service or convenience of the government, but less likely than daily smokers to be discharged for medical reasons, behavioural disorders and personality disorders. Never smokers were less likely than both other and daily smokers to be discharged for medical reasons and sexual disorders. Daily smokers were significantly more likely to be discharged for the most serious type of discharge, punitive discharge, than other smokers (but not never smokers).

With regard to the specific groupings of reasons for discharge, two measures were statistically significant (misconduct and drug misuse) and one was not (pregnancy). Never smokers were significantly less likely than daily smokers to be discharged because of misconduct or drug misuse. Pregnancy-related discharges, on the other hand, did not differ significantly among the three groups. All groups differed in their average Naval Health Research Center severity-of-loss scores. Daily smokers had the highest average scores, followed by other smokers, and never smokers had the lowest severity-of-loss scores.

Table 1 also shows the results from the multivariate analyses conducted for each attrition/retention outcome after controlling for the significant demographic/accession variables given in table 3. These multivariate analyses confirmed that all the attrition/retention outcomes significantly related to smoking group in the bivariate analyses were also independently significantly associated with smoking category after controlling for years of education, race/ethnicity, term or enlistment and regular/reserve status.

Table 2 presents career performance variables by smoking groups. In the bivariate analyses, the smoking groups differed in the numbers of promotions, demotion and desertions; however, only demotions and desertions remained significantly related to smoking category after controlling for the four significant demographic/accession covariates and time in service (which was entered as a covariate for all the career performance outcomes because they are time-dependent). While daily smokers had higher numbers of demotions and desertions than never smokers, the number of unauthorised absences did not differ significantly across smoking groups in either the bivariate or multivariate analyses.

A significantly higher percentage of never smokers than daily smokers re-enlisted subsequent to the first enlistment. Other smokers were intermediate on the two re-enlistment variables, but were not significantly different from the other two groups. Regarding highest paygrade earned during enlistment, all three groups differed significantly from one another. Never smokers had the highest mean paygrade level, followed by other smokers, and then daily smokers. Even after controlling for years of education, race/ethnicity, term or enlistment, regular/reserve status and time in service, smoking group remained significantly related to reenlistment and higher paygrade (table 2).

Although daily smokers had the lowest percentage and never smokers the highest percentage of service members ever completing a tour of sea duty, smoking group did not remain

significant after controlling for covariates in the multivariate analysis. Lastly, whether a service member received an officer commission was not associated with smoking group in either the bivariate or multivariate analyses (see table 2).

DISCUSSION

To our knowledge, no previous study has examined an all-female cohort entering a branch of the US military to assess whether cigarette smoking prior to entering the military would prospectively predict subsequent career performance. Comparisons among groups defined by self-reported smoking just prior to entering the US Navy indicated a consistent pattern of results. Compared with never smokers, daily smokers at entry into the Navy were subsequently more likely to have poorer outcomes on a wide variety of Navy career indicators. Daily smokers were more likely than never smokers to sign up for shorter-term enlistments, leave the Navy prior to serving a full-term enlistment (ie, early attrition) and spend less overall time in naval service. Daily smokers were also more likely to receive less-than-honourable discharges, more misconduct (eg, behavioural, personality, sexual, drug-related and punitive) discharges, more demotions and desertions, achieve a lower final paygrade and be less likely to re-enlist. The category of other smokers (ie, had smoked, but not daily at entry into the Navy) consistently fell between never and daily smokers on career outcome measures. These differences in attrition/retention and career performance outcomes across smoking groups remained significant even after controlling for potentially confounding covariates, including years of education, race/ethnicity, term of enlistment, regular/reserve status and time in service.

Findings from this study provide a greater understanding of the relationship between smoking and military service-related outcomes among Navy women. Such an understanding is important because women are a significant source of personnel strength in the US Navy, with about 59 000 women currently serving. Women are integrated into combat roles, the majority of Navy jobs are open to women, and women are expected to continue to comprise a significant portion of US Navy personnel. As the numbers and opportunities expand for Navy women, a better understanding of the relationships among health, lifestyle and job performance in women will become increasingly important.

Prior to this study, some information was available on the effects of smoking on military performance, costs, attrition and health of service members; however, there were important gaps in the knowledge base. For example, previous relevant studies have analysed data from branches of the armed services other than the Navy, extrapolating findings to Navy personnel rather than assessing them directly.¹⁵ Also, most previous studies focused on smoking as a predictor of a single or few outcomes, such as excess training costs or absenteeism, or measured relatively short-term outcomes of smoking (eg, attrition during the first year of enlistment).¹⁵⁻¹⁷ Little was known about the association of smoking with longer-term personnel outcomes, such as career advancement, disciplinary problems and re-enlistment decisions. Most previous studies have been descriptive, ecological or based on aggregated data, limiting the ability to make prospective inferences about smoking as a risk factor for subsequent personnel-related outcomes. Finally, military women were often not included in previous studies, or their smoking and outcome data were combined with men's and not presented separately. Recent studies suggest that smoking initiation, smoking maintenance, cessation experiences, relapse patterns and even biological and genetic sensitivity to the damaging effects of smoking may be different for women and men.³²⁻³⁵ Thus, it was important to examine the association of

What this paper adds

To our knowledge, no previous study has examined an all-female cohort entering a branch of the US military to examine whether cigarette smoking prior to entering the military is a prospective predictor of subsequent career experiences and performance. Comparisons were made among groups defined by self-reported smoking just prior to entering the US Navy as daily smokers, non-daily other smokers and never smokers. A consistent pattern of results indicated that compared with never smokers, daily smokers at entry into the Navy were subsequently more likely to have poorer outcomes on a wide variety of Navy career indicators.

smoking with subsequent personnel and job-related outcomes separately for women.

The findings from this study have implications for additional research. As a group, daily smokers at entry into the Navy consistently had the poorest performance outcomes during their time in the service when compared to never or other smokers. Although never smokers typically had the best performance outcomes, other smokers generally fell in between never and daily smokers. This general trend suggests that entering the Navy as a less-regular smoker, rather than a daily smoker, may be associated with better career outcomes. It should be noted, however, that even these prospective findings do not necessarily mean that getting smokers to stop before entering the Navy will improve subsequent career performance. Cigarette smoking might simply be a "marker" for other underlying factors (eg, non-conformity, high risk-taking) that contribute to poorer performance in the military. In fact, an interesting empirical question is whether an intervention to help daily smokers either to reduce their smoking to non-daily or to become former smokers *prior* to entering the Navy could have an impact on subsequent career outcomes. The Delayed Entry Program, in which many recruits participate prior to entry into the Navy, could provide an ideal opportunity for smoker-enlistees to take part in smoking cessation programmes. Future research should evaluate the impact of smoking cessation intervention prior to entering the Navy to determine whether this can improve subsequent career outcomes.

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14. ABSTRACT (maximum 200 words)

This study of female sailors examined whether tobacco use prior to entering the Navy predicted subsequent career outcomes related to length of service, early attrition, and misconduct, over a possible 7 to 8 year follow-up. For almost 5,500 women entering the U.S. Navy between March 1996 and March 1997, who participated in *Operation Stay Quit* (OSQ) (USAMRMC Grant #DAMD17-95-1-5075), smoking history data were merged with personnel and medical data from the Career History Archival Medical and Personnel System, a database maintained by the Naval Health Research Center, San Diego. The sailors were classified based on their smoking history behavior into three groups: women who never smoked, those who smoked occasionally, and those who smoked daily. The groups were compared on career indicators. A consistent pattern of results indicated that, compared with Never smokers, Daily smokers at entry into the Navy were subsequently more likely to have poorer outcomes on a wide variety of Navy career indicators (e.g., shorter-term enlistments, more early attrition, more less-than-honorable discharges, more misconduct discharges, more demotions and desertions, achieved a lower final paygrade, less likely to be recommended for reenlistment, and less likely to reenlist). The category of Other smokers (i.e., had smoked, but not daily at entry into the Navy) consistently fell between Never and Daily smokers on the career indicators. Future research should evaluate the impact of smoking cessation intervention to help daily smokers become non-daily or former smokers prior to entering the Navy to determine whether this can improve subsequent career outcomes and help prevent or circumvent the high costs associated with lifestyle-related early attrition and poor job performance.

15. SUBJECT TERMS

Navy women, smoking history, prospective, attrition, job performance, military

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